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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/614,645	07/07/2003	Kevin Parkin	CIT.PAU.37	7649

7590 05/10/2005

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EXAMINER

CASAREGOLA, LOUIS J

ART UNIT	PAPER NUMBER
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3746

DATE MAILED: 05/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/614,645

Applicant(s)

PARKIN, KEVIN

Examiner

Louis J. Casaregola

Art Unit

3746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 2 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 3/30/05.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☒ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) 11-21,27-28,33 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-6,22-24,31-32 is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☒ Claim(s) 7-10,25-26,29-30 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input checked="" type="checkbox"/> Other: <u>Reasons For Allowance</u> . |

Election

Applicant's election of the of the invention of Group I (apparatus) and the species comprising hydrogen propellant and a plug-type nozzle is acknowledged. The election was made with traverse. Applicant's arguments have been considered but are not however persuasive in demonstrating that restriction is improper.

Applicant argues that the claims in this case require a single search. This is simply not true. The non-elected method claims of Group II are classified in method subclass 60/204, which is not in fact part of the required examination search for the elected apparatus claims of Group I. The restriction between method and apparatus is therefore considered proper. That requirement is consequently made final, and the claims of non-elected Group II are withdrawn from further consideration.

It is not clear whether applicant's traverse is also intended to apply to the species election requirement. This point is considered moot, however, since all claims in elected Group I are examined below.

Objections To Claims

Claims 7-10, 25, 26, 29 and 30 are objected to under 37 CFR 1.75(a) for the following reasons:

In claims 7 and 8, reference to "the microwave absorber" (line 1) lacks antecedent basis. This element is introduced in claim 6, but claims 7 and 8 each depend on claim 4. Claims 7 and 8 should therefore be amended to depend from claim 6.

In claim 9, "the susceptor" (line 1) also lacks antecedent basis. This element is introduced in claim 8, but claim 9 depends from claim 1. Claim 9 should therefore be amended to depend from claim 8.

Claims 10, 25, 26, 29 and 30 are included in this objection since they each depend from one of claims 7-9 and thus inherit objectionable material from their respective parent claims.

Allowable Subject Matter

Claims 1-6, 22-24, 31 and 32 are allowed, and claims 7-10, 25, 26, 29 and 30 will be allowed if amended to overcome the objection set forth above. Allowance of this application is further contingent upon cancellation of non-elected claims 11-21, 27, 28 and 33.

Reasons For Allowance

The claimed invention is a thruster in which microwave energy at or above approximately 35 GHz is provided to a heat exchanger to heat a propellant, thereby creating an expanding medium which is then supplied to a thrust conversion device to produce thrust. Thrusters of this general type are well known in the propulsion field as indicated, for example, by the patents to Minovitch, Schiff and Brown cited on the attached Form PTO-892. These prior art systems however all appear to operate at frequencies much lower than 35GHz. Minovitch suggests a frequency of 10 GHz (column 2, line 43). Both Schiff and Brown further suggest a practical lower wavelength limit of 2 cm (col. 3), which can be shown through simple calculations to correspond to a frequency that is also well under 35GHz. The patent to Foote (also cited on PTO-892) discloses an aircraft propulsion system that does in fact receives microwaves at 35GHz. This system however is not a thruster that employs microwave heating, but rather, an electric motor drive system that converts microwaves to electric power. There would thus be no logical reason to change the operating frequency of the Minovitch, Schiff or Brown devices based on the disclosure of Foote. None of the references of record, moreover, disclose or fairly suggest a thruster of the type claimed having a microwave source operating at or above 35 GHz. The claimed invention is therefore considered patentable over the prior art.

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571-272-4826 (M-F; 7:30-4:00)
703-872-9306 FAX
May 5, 2005



LOUIS J. CASAREGOLA
PRIMARY EXAMINER

If repeated attempts to reach the examiner by telephone are unsuccessful, the art unit supervisor, Cheryl Tyler, can be reached at 571-272-4834.

Information regarding the status of this application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR, and status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).